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BAS-016

B.TECH. (AEROSPACE ENGINEERING) (BTAE)

00434

Term-End Examination

June, 2014

BAS-016 : PROPULSION - II

Time : 3 Hours *Maximum Marks : 70*

Note : *(i) Attempt **any five** questions. All questions carry **equal** marks.*

*(ii) Use of scientific calculator is **permitted**.*

(iii) Use of steam table and mollier chart is allowed.

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1. (a) Describe ignition system of a jet engine with a neat sketch. 7

(b) Explain turboprop engine cycle in detail. 7

2. (a) Define nozzle efficiency. Derive the expression for frictionally resisted expansion. 7

(b) A nozzle expands steam from 14 bar and 300°C to 6 bar. If the flow rate is 1 kg/s. Find the throat area and exit area. What should be the coefficient of velocity if the exit velocity is 550 m/s ? 7

3. (a) Discuss aerodynamic design process of axial flow compressor. 7

(b) Derive an expression for C_L and C_D with and without friction in case of axial compressor. 7

4. Following particulars relate to a centrifugal compressor : **14**

Inlet diameter of impeller = 61.4 cm
Outlet diameter of impeller = 12.3 cm
Speed = 500 rpm
Velocity of flow = 61.6 m/s
Free air delivered = 1000 m^3/min
Pressure ratio = 1.33
Index of compression = 1.6
Assuming that all pressure rise takes place in the impeller. Find the angle at which air from impeller enters the casing. Also find breadth of the impeller blade at inlet and outlet.

5. (a) Derive an expression for work done per stage of an axial flow turbine. 7

(b) What is the cause of axial thrust in turbine ? How is it taken care of ? 7

6. (a) Discuss the factors that affect combustion chamber performance. 7

(b) Explain the fuel system of a jet engine in detail. 7

7. Write short notes on **any four** of the following : **3.5x4=14**

(a) Blade cooling
(b) Air cooling system
(c) Cascade action
(d) Turbojet with after burner
(e) Flame stability
(f) Diffuser in subsonic flow